First-passage percolation on the n-dimensional hypercube and other n-fold product graphs

Anders Martinsson

Chalmers University of Technology

Abstract

We consider first-passage percolation on the n-dimensional binary hypercube with independent exponentially distributed passage times with mean one. In a paper from 1993 by Fill and Pemantle, it is shown that the first-passage time between opposite corners of the hypercube lies, in the large n limit, between $\ln\left(1+\sqrt{2}\right) \approx 0.88$ and 1. In a recent paper, I show that T_n converges to $\ln\left(1+\sqrt{2}\right)$ as $n \to \infty$. I will discuss some of the ideas behind these results. Towards the end of the talk, I will propose a generalization of this analysis to graphs of the form $G\Box G\Box \ldots \Box G$, the n-fold cartesian product of some fixed graph G and give some preliminary results for first-passage percolation in this setting.